

BLACKWATER LEVEE/BAR FOREST

Concept: The Blackwater Levee/Bar Forest type consists of forests and woodlands on the interior of point bars and along banks of blackwater rivers, where *Betula nigra* or *Planera aquatica* are a significant component. These communities represent the middle stages of primary succession on point bar deposits along migrating river meanders.

Distinguishing Features: Blackwater Levee/Bar Forest is distinguished from Blackwater Bottomland Hardwoods by the presence of more than very small amounts of *Betula nigra* or (on the lower Lumber and Waccamaw Rivers) *Planera aquatica* in a natural riverbank or sand bar location. It is distinguished from Sand and Mud Bar by having substantial cover of trees rooted in the community. It is distinguished from Brownwater Levee Forest by the absence or near absence of *Platanus occidentalis*, *Fraxinus pennsylvanica*, *Acer negundo*, *Acer saccharinum*, and other characteristic brownwater species.

Synonyms: *Betula nigra* - *Quercus laurifolia* - *Taxodium (distichum, ascendens)* / *Crataegus aestivalis* Forest (CEGL004282).

Ecological Systems: Atlantic Coastal Plain Small Blackwater River Floodplain Forest (CES203.249).

Sites: Blackwater Levee/Bar Forest generally occurs on point bar deposits on the inside of active river meanders. It occurs on surfaces that are fairly recently deposited but which are higher above the river and older than those that support Sand and Mud Bar.

Soils: Soils are sandy and have little or no horizon development. Patches are too small to be distinguished on soil mapping.

Hydrology: Blackwater Levee/Bar Forests are seasonally to frequently flooded. Being close to the river, they may be subject to significant currents during floods. They may be well drained when the river is low.

Vegetation: The vegetation may have a dense or open canopy. *Betula nigra* or, on the Waccamaw and Lumber River, *Planera aquatica* are abundant and usually dominant. *Acer rubrum* var. *trilobum*, *Quercus lyrata*, *Quercus laurifolia*, or *Taxodium distichum* are often present but primarily as young individuals. *Crataegus* sp. and *Fraxinus caroliniana* also are frequent. Shrubs are generally limited, other than shrub-sized saplings, but *Vaccinium elliotii*, *Cyrilla racemiflora*, *Ilex amelanchier*, or other species of the riverbanks may be present. *Muscadinia rotundifolia*, *Smilax rotundifolia*, or other vines may dominate patches. Herbs are often patchy, with dense cover in some areas, sparse cover in others. Frequent species include *Boehmeria cylindrica*, *Persicaria* spp., *Justicia ovata* var. *ovata*, and on the Waccamaw River, *Hymenocallis pygmaea*. Other species may include a number shared with more open sand bars, such as *Phanopyrum gymnocarpum*, *Coleataenia rigidula*, and *Gratiola neglecta*. As with open bars, many species may be young individuals or be short lived. The exotic species *Murdannia keisak* and *Alternanthera philoxeroides* may be present.

Range and Abundance: Ranked G2G3. In North Carolina, this community is well developed only on the large blackwater rivers such as the Lumber, Waccamaw, Black, and Northeast Cape Fear and is very limited in extent. It also occurs in South Carolina, and the synonymized NVC association is questionably attributed to Georgia.

Associations and Patterns: Blackwater Levee/Bar Forest occurs in small patches that are scattered along meandering portions of rivers. Not every meander has a well-developed patch. Patches tend to be bordered by Sand and Mud Bar on the youngest part of the point bar and to give way to Blackwater Bottomland Hardwoods on older portions. They may also be bordered by Cypress–Gum Swamp in a slough behind them.

Variation: Two variants are recognized, based on range limits of frequent species.

1. Water Elm Variant occurs in areas within the range of *Planera aquatica*. This species tends to be important in the community when it is present, though *Betula nigra* also often is abundant.
2. Northern Variant occurs in areas outside the range of *Planera aquatica*, where *Betula nigra* is the predominant species.

Dynamics: Blackwater Levee/Bar Forests are communities of mid-primary succession, developing when point bar deposits have become high and stable enough to allow trees to establish. *Betula nigra* and *Planera aquatica* are the first tree species to become dominant, and they are eventually supplanted by the oaks of Blackwater Bottomland Hardwoods. It is not well known how long this process takes. It is also unclear whether all sites are on a steady successional trajectory or if some are maintained or periodically reset by flood scouring. While point bars are deposited because current is slow on the inside of meanders, during floods water can flow across them with substantial velocity and new layers of sand may be deposited. While young individuals of the succeeding species are often present, it is not clear if they will mature. Intermediate age individuals often are lacking. Ongoing succession may not be possible until additional deposition raises the surface or until further channel migration and bar deposition leads to greater stability.

As in the Brownwater Levee Forests, frequent sediment deposition presumably provides an important nutrient subsidy, but the low nutrient content of blackwater and the limited nutrient-holding capacity of the sand likely make this a marginal benefit on blackwater rivers.

Comments: Blackwater rivers do not generally have well-developed natural levees of the sort created by overbank flooding on brownwater rivers, because of their low suspended sediment load. While the 3rd Approximation had a Blackwater Subtype of Coastal Plain Levee Forest that was conceived as being analogous to the Brownwater Subtype, none of the communities to which it was applied were very distinctive. Levee species such *Betula nigra* may occur along blackwater rivers outside of point bars, but generally only as scattered individuals rooted in the bank. The narrow band of bank vegetation is too limited in area to be recognized as a distinct community. Though there are not well-developed natural levees, movement of sand by blackwater rivers does create point bars which are young substrates suitable for this community. This community is analogous to the Bar Subtype of Brownwater Levee Forest.

Rare species:

Vascular plants: *Gratiola aurea* and *Hymenocallis pygmaea*.

References: